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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

VILLAGE OF MERRICKVILLE

COUNTY OF GRENVILLE

1966

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VILLAGE OF MERRICKVILLE - 1966
(COUNTY OF GRENVILLE)

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Report on a water pollution
survey of the village of
Merrickville in the county of
Grenville.

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THE
ONTARIO WATER RESOURCES COMMISSION

Report on a
WATER POLLUTION SURVEY

of the
VILLAGE OF MERRICKVILLE

in the
County of Grenville

Division of Sanitary Engineering

1966

WATER POLLUTION SURVEY
of the
VILLAGE OF MERRICKVILLE

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A P P E N D I C E S

INTERPRETATION OF ANALYSES

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MAP OF THE VILLAGE OF MERRICKVILLE

WATER POLLUTION SURVEY
of the
VILLAGE OF MERRICKVILLE

INTRODUCTION

A water pollution survey was performed in the Village of Merrickville on November 22, 1965. Surveys of this type are made by the Ontario Water Resources Commission for the purpose of locating and recording sources of existing and potential water pollution. Recommendations are made concerning the abatement of conditions which might adversely affect water quality.

A similar survey made in 1962 recommended that effective measures should be taken by this municipality to prevent the discharge of untreated or inadequately treated wastes to the Rideau River.

A map of the village showing sampling point locations is appended to this report, as are the laboratory results of this and the previous survey.

Valuable assistance was provided by the following officials:

Mrs. J.M. Thompson, Clerk-Treasurer, Village of Merrickville;

Mr. J.A. Cranston, Works Foreman, Village of Merrickville;

Mr. B. Young, Chief Public Health Inspector, Leeds and Grenville Health Unit.

VILLAGE OF MERRICKVILLE

General

First settled in 1794, Merrickville is located at the intersection of Highway No.43 and the Rideau River in the County of Grenville. A prominent centre during the construction of the Rideau Canal and one of the oldest industrial sites in Ontario, Merrickville became incorporated as a village in 1860. The Village of Merrickville has a population of 909 according to the 1965 Municipal Directory and covers an area of 708 acres.

Rideau River

The Rideau River has its head waters in the Rideau Lakes System. It follows a northerly course, passes through Merrickville and enters the Ottawa River within the City of Ottawa. The series of locks located at Merrickville are normally closed and drained from November to May. During this period the entire river flow pursues the original course of the river just north of the canal. A dam provided in this section of the river permits control of water levels during periods of dry weather flows.

Surface Water Drainage

Municipal storm sewers and drainage ditches are utilized to direct surface water flows to the Rideau River. A previous investigation revealed that inadequately treated wastes were reaching

the river via the storm sewer system. Observations during this survey indicate that contaminated domestic and industrial wastes were continuing to gain access to the municipal storm sewers.

Water Supply

The municipal water works located on Main Street utilizes two drilled wells as the source of water supply. Chlorination is the only treatment afforded. A 150,000-gallon covered ground reservoir is provided for storage purposes. Service connections total 261 and it is estimated that only 15 to 20 properties are not on the municipal supply.

Sewage Disposal

In the absence of municipal sanitary sewers, sewage disposal is normally achieved on an individual basis. New septic tank systems are installed under the supervision of the Leeds and Grenville Health Unit staff. However, unsatisfactory sewage disposal methods are employed at numerous premises as a result of inadequate space and insufficient overburden for proper sub-surface systems. These may take the form of private connections to local storm sewers or private outfalls to the river. The closing of the District H.E.P.C. Office has eliminated one private sanitary waste discharge to the river noted in the previous survey report. It is

generally conceded by the municipality and the local health authorities that correction of a number of unsatisfactory sewage disposal methods on an individual basis is impractical, particularly at some properties in the older developed areas of the village.

It is evident that a municipal sewage works project is needed at this municipality. A preliminary engineering report was prepared by the firm of J.L. Richards & Associates, Consulting Engineers, in 1963. A decision by council in 1964 to proceed with a new five-room public school has temporarily delayed the sewage works project.

Industry

The following are the principle industries located in the Village of Merrickville.

<u>Name of Firm</u>	<u>Product</u>
Alloy Foundry Company Ltd.	grey iron
Grenville Castings Limited.	magnesium castings
Peter Ayling & Associates Marina	Boats
Merrickville Electro-Plating Services and Furniture Co.Ltd.	Metal finishing and precision plating.
Merrickville Chrome Furniture	Chrome furniture

No liquid industrial wastes are produced by the above industries with the exception of the Merrickville Electro-Plating Services and Furniture Co. Ltd. The latter industry discharges a rinse solution to the municipal storm sewers. In-plant treatment is normally provided to reduce the waste concentrations to permissible limits for discharge to the storm sewer. Reportedly, there are no sanitary waste disposal problems at the above industries.

Refuse Disposal

The village maintains a refuse disposal site in the south-east area of the municipality. Garbage pick-up is provided and the refuse is removed to the disposal site where it is burned and periodically compacted and covered. No water pollution problems are contemplated from the operation of this disposal site.

SAMPLING PROCEDURE

Samples were collected from the Rideau River and from evident discharges thereto within the Village of Merrickville. All samples were submitted to the Ontario Water Resources Commission Laboratory for examinations.

On the day of sampling, temperatures ranged from a low of 25°F to a high of 35°F. A snow fall during the previous day hampered observation of unsatisfactory waste disposal procedures.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to assess the quality of surface waters were biochemical oxygen demand (BOD), suspended solids and total coliform count. A copy of the interpretation of the various analyses employed by the laboratory is appended to this report.

Laboratory analyses used in this survey to assess the quality of outfall discharges included the above determinations plus analyses for pH, phenols and cyanide as HCN.

The OWRC objectives for surface water quality are that the following concentrations are not exceeded:-

BOD - 4.0 ppm

Coliform Count - 2400 coliforms per 100 ml.

Adequate protection for surface waters, except in certain specific instances influenced by local conditions, is generally obtained if the following waste discharge concentrations are not exceeded:

BOD - 15 ppm

Suspended Solids - 15 ppm

pH - 5.5 to 10.6

Phenol - 20 ppb

Cyanide as HCN - 0.1 ppm

POLLUTION SOURCES INDICATED BY SAMPLE RESULTS

The laboratory results of the water samples collected from the Rideau River are satisfactory.

Excessive concentrations of coliforms are noted in the discharges from the storm sewer outfalls at the rear of the municipal water works and the United Church. Laboratory analyses indicate that unsatisfactory sanitary and industrial wastes are gaining access to the above storm sewers.

An excessive cyanide concentration of 9.0 ppm was revealed in the Merrickville Electro-Plating Services and Furniture Company Limited plant discharge.

SUMMARY

A water pollution survey performed in the Village of Merrickville revealed that inadequately treated wastes continue to gain access to the municipal storm sewer system which discharges to the Rideau River. Provision of municipal sewage works will be necessary to eliminate this unsatisfactory condition. The Merrickville Electro-Plating Services and Furniture Company Limited is required to provide sufficient in-plant treatment to reduce the cyanide content of its waste discharge to an acceptable level.

RECOMMENDATIONS

1. Merrickville should make every effort to proceed with its municipal sewage works programme.
2. The Merrickville Electro-Plating Services and Furniture Company Limited should effect adequate in-plant treatment to produce an acceptable waste effluent.

All of which is respectfully submitted,

Approved by:



L. G. South, P. Eng.,
Acting District Engineer,
Division of Sanitary Engineering

Prepared by: W.C. Stevens

jp

INTERPRETATION OF ANALYSES

The analyses employed in this investigation to assess the quality of the surface water and outfall discharges included:

Biochemical Oxygen Demand (BOD)

The BOD of sewage and polluted waters is the oxygen required for stabilization of the decomposable organic matter or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20°C is reported. A high BOD is indicative of organic or chemical pollution.

Solids

The analyses for solids include tests for total, suspended and dissolved solids. The first test measures both the solids in solution and in suspension. The results are reported in parts per million.

The suspended solids indicate the measure of undissolved solids of organic or inorganic nature in suspension. Land erosion, sewage, and industrial wastes are significant sources of suspended solids. The effect of suspended solids in water is reflected in difficulties associated with water purification and deposition in streams which could interfere with navigation and injure the habitat of fish. Where suspended solid values, ascertained by a quantitative analysis, approach 20 parts per million or less, laboratory difficulties usually result in these values being determined as turbidity, a

qualitative analysis.

The dissolved solids are a measure of those solids in solution.

Turbidity

Turbidity is caused by the presence of suspended matter such as clay, silt, finely divided organic matter, plankton and other microscopic organisms in water. It is an expression of the optical property of a sample and results are reported in "turbidity units".

Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from chemical industries. Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish. Phenols are reported in parts per billion (ppb).

pH

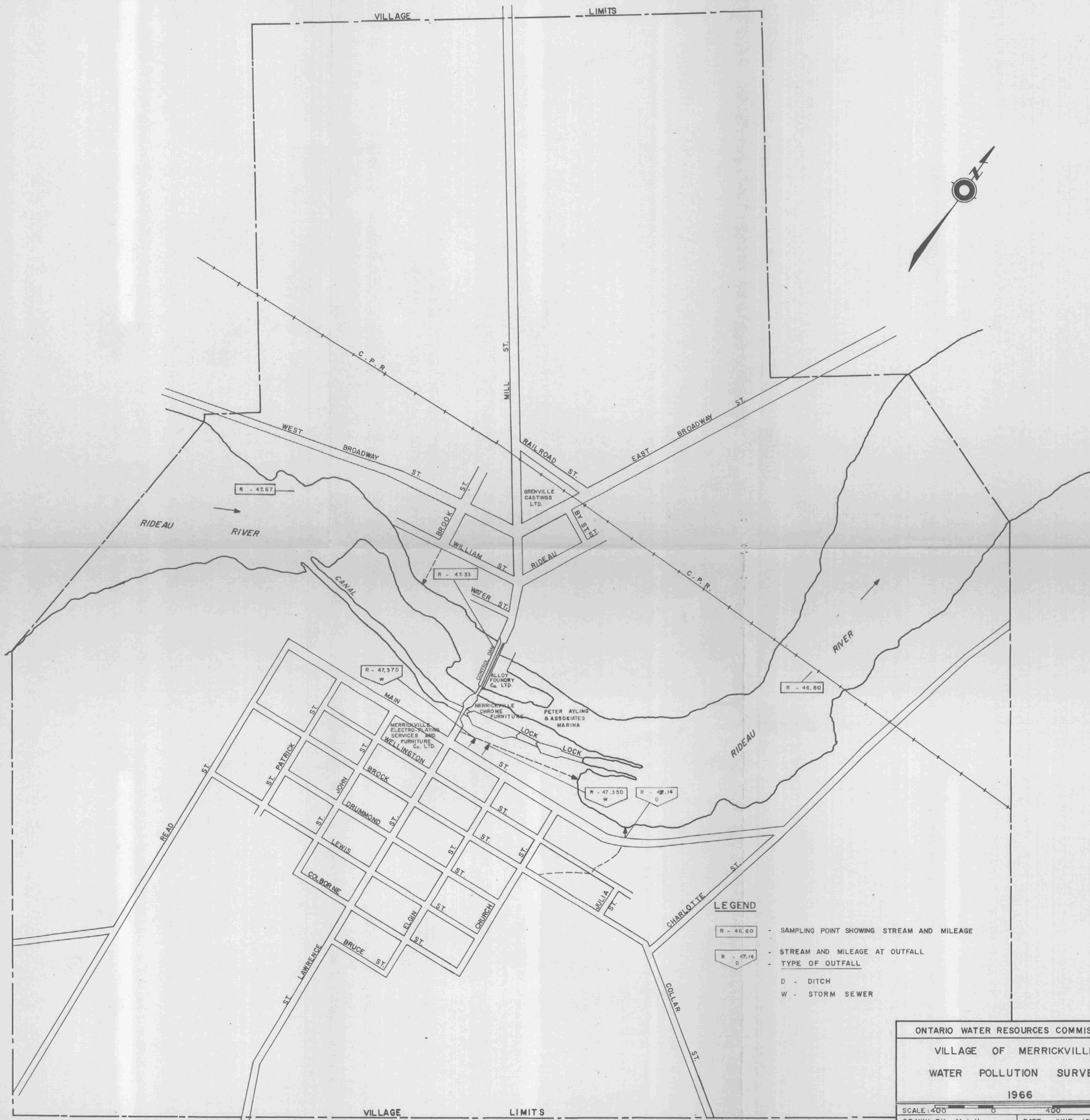
The pH value, for practical purposes, refers to acidity or alkalinity and is a measure of intensity rather than quantity. The pH scale extends from zero (very acidic) to 14 (very alkaline) with the middle value of 7 corresponding to neutrality at 25° Centrigrade.

VILLAGE OF MERRICKVILLE
WATER POLLUTION SURVEY

<u>Sample Point No.</u>	<u>Description</u>	<u>Date</u>	<u>Coliforms per 100 ml.</u>	<u>5-Day BOD</u>	<u>SOLIDS</u>		<u>Turbidity</u>	
					<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>	
R 46.80	Rideau River at CPR Bridge downstream from Merrickville	Mar.28/62	104	3.1	228	-	-	3.3
		Nov.22/65	100	1.2	200	6	194	-
R-47.14D	Ditch to Rideau River at the east end of Main Street	Mar.28/62	2,300	1.9	392	42	350	-
		Nov.22/65	2,100	0.5	432	8	424	-
R-47.33	Rideau River at Merrickville Dam	Nov.22/65	130	0.9	212	6	206	-
R-47.35D-W	Storm Sewer Discharge to ditch at rear of Municipal Water Works	Mar.28/62	26,300	7.2	382	34	348	-
		Nov.22/65	200	2.8	834	34	800	-
			Cyanide as HCN	-	8.0			
			Phenols in ppb	-	8.0			
			pH at Lab.	-	8.2			
R-47.37D-W	Storm Sewer Discharge to ditch at rear of United Church.	Nov.22/65	10,000	1.4	820	22	798	-
			Cyanide as HCN	-	0.0			
			Phenols as ppb	-	15.0			
			pH at Lab	-	7.7			
R-47.67	Rideau River near upstream limit of Merrickville	Mar.28/62	900	3.0	192	-	-	3.5
		Nov.22/65	70	1.3	230	4	226	-

Village of Merrickville
Water Pollution Survey

<u>Sample Point No.</u>	<u>Description</u>	<u>Date</u>	<u>Coliforms per 100 ml.</u>	<u>5-Day BOD</u>	<u>Solids</u>		
					<u>Total</u>	<u>Susp.</u>	<u>Diss.</u>
	Merrickville Electro-Plating Services and Furniture Co. Ltd. - Discharge to municipal storm sewer.	Nov.18/65	0	4.0	764	46	718
		pH at Lab.	-	8.9			
		Cyanide as HCN	-	9.0			
		Phenols in ppb	-	20.0			



ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF MERRICKVILLE

WATER POLLUTION SURVEY

1966

SCALE: 400 0 400 800 FEET

DRAWN BY: M.I.H.

DATE: JUNE 1966

CHECKED BY: R.W.

DRAWING NO: 66-37